Dist-County-Route: 07-Ven-118
Post Mile Limits: PM 10.72/11.8, KP(17.25/18.99)
Project Type: Intersection Improvement
Project ID (or EA): 105960
Program Identification: SHOPP (HB4N)
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Los Angeles, Region 4

Is the Project required to consider Treatment BMPs? Yes ☒ No ☐
If yes, can Treatment BMPs be incorporated into the project? Yes ☒ No ☐
If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date:

Total Disturbed Soil Area: 7.58 Acres (Alternative 2) Risk Level: 3
Estimated: Construction Start Date: March 7, 2018 Construction Completion Date: June 28, 2019
Notification of Construction (NOC) Date to be submitted: February 4, 2018

Erosivity Waiver Yes ☐ Date: No ☒
Notification of ADL reuse (if Yes, provide date) Yes ☐ Date: No ☒
Separate Dewatering Permit (if yes, permit number) Yes ☐ Permit # No ☒

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Darrel A. Cruz — 4/4/11
Darrel Cruz, Registered Project Engineer/Landscape Architect — *Date*

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Adel Girgis, Project Manager — 4/13/2011 *Date*

Roger Castillo, Designated Maintenance Representative — 04-14-11 *Date*

Ron Russak, Designated Landscape Architect Representative — 04·14·11 *Date*

[Stamp Required for PS&E only] *Shirley Pak, District/Regional Design SW Coordinator or Designee* — 4/20/2011 *Date*

STORM WATER DATA INFORMATION

1. Project Description

- This is an intersection improvement project located on SR 118 and SR 34, near the town of Somis, in Ventura County. The goal of this project is to reduce delays by improving the intersection of SR 118/ SR 34. The work will consist of roadway widening; adding extra lanes, adding extra storage capacity of left turn pockets, relocation of Donlon Road to make it the north leg of the existing SR 118 / SR 34 "T" intersection, a new bridge crossing over Coyote Creek will be added along the new Donlon Road alignment. The Project Report and Environmental Document was approved by Caltrans on September 29, 2000. A new Environmental Document needs to be done and upgraded to an Environmental Impact Report (EIR) due to a court ruling entered on January 10, 2003. A new Draft Project Report has to be initiated as well with the same six viable alternatives as before.

  The six Viable Alternatives are as follows:

  Alternative 1

  Is the No-Build.

  Alternative 2

  This proposal will modify the intersection by adding an extra left turn lane on the westbound SR 118 making a total of two 800' westbound left turn lanes vs. the one existing 160' left turn lane. The shoulder widths will be changed to the standard 8' shoulder. The County of Ventura will relocate the existing SR118/Donlon Road "T" intersection to align with the existing SR118/SR34 "T" intersection prior to this project. This project, due to the widening at this location, needs to design the realigned SR118/Donlon Road intersection as per Caltrans standards, Highway Design Manual 405.6 "Access Control and 405.7 "Public Road Intersection". Elements such as sight distance, turning templates etc. must be considered as part of the design.

Reconstruction of the existing pavement along with the new roadway widening portion of the project using the new structural section recommendation.

Additional new features are:

1. add one right turn and one 574' left turn lane on the eastbound SR 118
2. add one auxiliary lane on the southbound SR34
3. add one auxiliary lane on the eastbound SR 118 for vehicles making right turns from northbound SR 34
4. add 490' of storage length to the existing northbound SR 34 left turn lane

Alternative 3

This proposal is the "Save Our Somis Alternative". The Somis community came up with this alternative. This alternative is similar to Alternative 2 except there will not be an additional left turn lane from westbound SR 118 to southbound SR 34. The total length for the existing left turn lane for westbound SR 118 at SR 34 will be changed to 1164' vs. the existing storage length of 160'. The shoulder widths will be changed to the standard 8' shoulder. The County of Ventura will relocate the existing SR118/Donlon Road "T" intersection to align with the existing SR118/SR34 "T" intersection prior to this project. This project, due to the widening at this location, needs to design the realigned SR118/Donlon Road intersection as per Caltrans standards, Highway Design Manual 405.6 "Access Control and 405.7 "Public Road Intersection". Elements such as sight distance, turning templates etc. must be considered as part of the design. Reconstruction of the existing pavement along with the new roadway widening portion of the project using the new structural section recommendation.

Additional new features are:

1. add one right turn and one 553' left turn lane on the eastbound SR 118
2. add 448' of storage length to the existing northbound SR 34 left-turn lane

Alternative 4

This alternative is the proposed roundabout alternative. This alternative will supercede the existing SR 118/SR 34 intersection with a roundabout. The new traveled way width will be made up of 24' one-way travel lane and a standard 8' left and right shoulder width. The existing SR 118/ Donlon Road "T" intersection will be relocated west of its existing location forming the north leg of the new intersection. A new bridge will be constructed over Coyote Creek along the new Donlon Road alignment. Reconstruction of the existing pavement along with the new roadway widening portion of the project using the new structural section recommendation.

The County of Ventura plans to complete the design and construction of Donlon Road Realignment as a separate project. Ventura County plans to have the work done by January 2012 prior to this project completion date. This alternative will no longer be feasible. The roundabout design has a different alignment, which is west of the existing SR 118/ SR 34 intersection. The north leg of the roundabout, being that of the new Donlon Road realignment would bypass what would be the County's newly created Donlon Road/ SR 118 intersection north of the existing SR 118/ SR 34 "T" intersection.

Alternative 5

This alternative is the "Somis Bypass Alternative" proposed by the community of Somis. This alternative involves building a new 2 lane highway that links both SR 34 and SR 118 east of the Somis community or bypassing the town. The existing SR 118/ SR 34 intersection will remain the same, except for the new addition of SR118/Donlon Road. This work will be completed by the County of Ventura prior to this project. The existing SR 118/ Donlon Road "T" intersection will be relocated westerly to align with the existing SR 118/ SR 34 "T" intersection. The realignment of Donlon Road will be at 90 degrees from the SR 118 alignment. A new bridge will be constructed over Coyote Creek along the new Donlon Road alignment. Reconstruction of the existing pavement along with the new roadway widening portion of the project using the new structural section recommendation. The shoulder widths will be changed to the standard 8' shoulder.

Additional new features are:

1. Two 800' left turn lanes will be added to the existing westbound SR 118 to the southbound Somis Bypass.
2. One auxiliary lane will be added to the existing eastbound SR 118 for vehicles making right turns from the northbound Somis Bypass.
3. One right turn lane will be added to the existing eastbound SR 118 for vehicles making a right turn to the southbound Somis Bypass.
4. The Somis Bypass at the SR 118 intersection will have one auxiliary lane on the southbound direction, one left turn lane and one right turn lane in the northbound direction.
5. One right turn lane will be added to the existing northbound SR 34 at the Somis Bypass intersection.
6. One left turn lane will be added to the existing southbound SR 34 at the Somis Bypass intersection.
7. The Somis Bypass at the SR 34 intersection will have one 1164' left turn lane in the westbound direction and one auxiliary lane on the eastbound direction for vehicles making right turns from the existing northbound SR 34.
8. A new bridge will be constructed over Coyote Creek along the new Somis Bypass alignment.

Alternative 6

This alternative is called the Proposed Bridge Alternative. It has similar widening changes as Alternative 2 with the exception of the Donlon Road realignment. The new Donlon Road will have a straight alignment north of the SR 118/SR 34 intersection.

The County of Ventura plans to complete the design and construction of Donlon Road Realignment as a separate project. Ventura County plans to have the work done by January 2012, prior to this project completion date.

Since the realignment of Donlon Road is no longer part of this Caltrans project, this alternative is no longer viable. This alternative is identical to Alternative 2, excluding the Donlon Road realignment.

- After the public hearing tentatively scheduled for September 14, 2011, the Environmental Document will recommend which alternative will be used. The Project Report will reflect what the Final Environmental Document selects as the preferred alternative. It is too early to tell which is the preferred alternative at this stage. We should know sometime in December, 2011.

- The total disturbed soil areas for this project is 7.58 acres (Alternative 2). The total disturbed areas was calculated by taking areas between existing Edge of Shoulder and the proposed right of way.

- Total cost for Alternative 2 is $14,221,000

- The existing impervious areas is 3.8 acres.

- The impervious surface areas after the project is completed is 6.6 acres.

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

    1. This project is under the authority of the Los Angeles Regional Water Quality Control Board (LARWQCB, Region 4).

    2. This project is in the Calleguas Watershed-East Las Posas (HAS 408.22). The receiving waterbodies in or near HAS 408.22 are: Arroyo Las Posas, Arroyo Santa Rosa, Arroyo Simi, Beardsley Wash, Calleguas Creek, Conejo Creek, Gillibrand Canyon Creek, Lake Bard (Wood Ranch Reservoir), Santa Clara River,Sespe Creek, Tapo Canyon Creek. Distance from the nearest receiving water to the project is 1mile.

    3. Fox Barranca (Tributary to Calleguas Creek Reach 6) and Calleguas Creek Reach 6 are on the 2006 303(d)list. The pollutants of concern (POCs) are: chloride, sulfates, total dissolved solids, fecal coliform, sedimentation/siltation, boron.

    4. There are no municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits.

    5. 401 Water Quality Certification is required from the Regional Water Quality Control Board (RWQCB). This will be provided in the next phase of this project.

6. The project limits are in the ***Calleguas Creek Watershed.*** The TMDLs are Calleguas Creek Nitrogen Compounds and Related Effects TMDL, OC Pesticides and PCBs

   TMDL, Toxicity, Chlorpyrifos and Diazinon TMDL , Metals and Selenium TMDL, Boron, Chloride, Sulfate, and TDS (Salts) TMDL,

   1. Calleguas Creek Nitrogen Compounds and Related Effects TMDL

   The Calleguas Creek Nitrogen Compounds and Related Effects TMDL became effective July 16, 2003. The TMDL requires the Calleguas Creek Watershed Management Plan Subcommittees to submit a Monitoring Work Plan and complete several special studies including planning and preparation of construction for TMDL remedies to reduce Nitrogen loads. Caltrans is actively participating in the Subcommittee and working toward compliance of the TMDL. Targeted Pollutants are Ammonia, NO3-N, NO2-N, and NO3-N+NO2-N.The Department's monitoring data depicts Caltrans discharges to be below the TMDL limits, thus no additional measures are needed to be considered for meeting the conditions of the Nitrogen TMDL.

   2. Calleguas Creek Watershed OC Pesticides and PCBs TMDL and the Calleguas Creek Watershed
   Toxicity, Chlorpyrifos and Diazinon TMDL

   The Calleguas Creek Watershed OC Pesticides and PCBs TMDL and the Calleguas Creek Watershed Toxicity, Chlorpyrifos and Diazinon TMDL became effective March 24, 2006. Targeted Pollutants are Chlordane, 4,4-DDD, 4,4- DDE, 4,4-DDT, Dieldrin, PCBs, and Toxaphene for Pesticides, and Chlorpyrifos and Diazinon for Toxicity. Caltrans is working cooperatively with other Responsible Agencies to jointly comply with the TMDL requirements. Project Engineers shall consider treatment controls for the project and consult with the District NPDES Storm Water Coordinator.

   3. Calleguas Creek Watershed Metals and Selenium TMDL

   The Calleguas Creek Watershed Metals and Selenium TMDL became effective March 26, 2007. The TMDL assigns waste load allocations to the Permitted Stormwater Dischargers (PSD) that include the Municipal Storm Water (MS4) Permittees, Caltrans and others. The PSD are required to achieve the final dry and wet weather waste load allocations in 15 years. Caltrans is working with a group of Responsible Agencies to jointly comply with the TMDL. Targeted pollutants are Copper (Cu), Mercury (Hg), Nickel (Ni), Zinc (Zn) and Selenium (Se). Project

Engineers shall consider treatment controls for the project and consult with the District NPDES Storm Water Coordinator.

4. Total Maximum Daily Load for Boron, Chloride, Sulfate, and TDS (Salts) in the Calleguas Creek Watershed

The TMDL for Chloride, Sulfate, and TDS (Salts) in the Calleguas Creek Watershed became effective December 2, 2008. The TMDL assigns interim and final Dry Weather waste load allocations (WLA) to the Permitted Stormwater Dischargers (PSD) for Chloride, Total Dissolved Solids (TDS), sulfate and Boron. The PSD are required to achieve the interim WLAs in a progressive manner and to meet the final WLAs in 15 years. Caltrans is not named in the TMDL.

7. The rainy season is from October 1 through May 1. Pacific Ocean weather is prevalent. Temperatures are mild. The climate zone is 23. The average annual rainfall is 15.9"

8. The site is in the Las Posas sub-basin and the area has been mapped as Quaternary Alluvium deposited by flood plains made up of clay, silt, sand and gravel. The site is categorized as soil type B. The groundwater levels are close to 30' below ground in the general vicinity of the SR 118/ SR 34 intersection.

9. The Risk Level for this project is 3 as determined by using the link: Project Risk Level Determination Guidance in the Caltrans Storm Water website. There may be a chance to lower the Risk Level during the design phase using the Individual Method in Section 2.2 of the link.

10. Soil containing Aerially Deposited Lead (ADL) will not be an issue. The 1994 SI report described the soil as having none to nominal amounts of ADL present within the project limits, along SR 118 and SR 34.

11. There are no plans for extra right of way to be acquired for BMPs.

12. There are no slope stabilization concerns within the project limits.

13. The local land use are mainly for agricultural activities and existing community.

14. Steps taken to diminish possible storm water impacts are:
    1. Disturbing existing slopes only when necessary
    2. Minimizing cut and fill areas to reduce slope lengths
    3. Rounding and shaping slopes to reduce concentrated flow
    4. Collecting concentrated flows in stabilized drains and channels
    5. Providing Construction Site BMPs during construction

3. Regional Water Quality Control Board Agreements

This project complies with the NPDES permits #CAS000002 and #CAS000003. Notification of Construction (NOC) needs to be submitted to RWQCB 30 days before the start of construction. 401 Certification is required.

4. Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

- The roadway widening will cause an increase in impervious surface area which in turn will most likely cause an increase in storm water volume.
- The creeks within the project limits are unlined and covered with vegetation on the slopes. An increase in sediment load of downstream flow will be mitigated by replanting native vegetation and providing rock slope protection in drainage and slope areas disturbed during construction.
- There are no anticipated hydraulic changes to the Coyote Creek other than the box culvert extention as part of the widening.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

- Both existing and proposed cut and fill side slope (H:V) varies between 2:1 and 4:1.
- Vegetated slopes for the most part are stable. Areas disturbed or impacted by construction will be re-vegetated following Caltrans Erosion Control Policies.
- Hard Surfaces (Rock Slope Protection) are required to stabilize watercourse in the streambed.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

- The concentrated flow conveyance systems being proposed for this project are new ac dike, ditches and rock slope protection.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

- This project will include clearing and grubbing and Preservation of Property as described in the Standard Specification Sections 16-1.01 and 16-1.02.
- Impact to the existing vegetation is limited to areas where construction is to be performed.
- The total cost for Design Pollution Prevention BMP is $471,500.

5. Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

- The Targeted Design Constituents (TDC) are: Ammonia, Nitrate and Nitrite, Nitrate as Nitrate (NO3) and Sedimentation/Siltation.

- There is no Corridor Study in this area, but it is assumed that approximately 20% of WQV/WQF can be treated at this preliminary stage. Calculations can be done later at the design stage.

- Treatment BMPs under consideration for the Targeted Design Constituent (TDC) of sediments are Biofiltration Strips and Biofiltration Swales.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

- Two Biofiltration Swales are included into this project. The approximate locations are on SR 118, between stations 651+00 to 654+00, one on each side of the highway, between the proposed edge of pavement and the new or existing state right of way. The approximate dimensions of the trapezoidal channel are 300' in length, 6' top width, 4' bottom width and 0.5' depth.

- Total Estimated Cost for 2 Biofiltration Swales=$100,000.00

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

- Dry Weather Diversions are not included in this project. Dry weather flows generated by Caltrans are not present within the project limits.

Infiltration Devices – Checklist T-1, Parts 1 and 4

- Infiltration Devices are not included into this project. It is not viable due to the harm it may pose to local groundwater quality. Groundwater in the vicinity of the SR 118/ SR 34 intersection may be contaminated. Based on the 2009 Hazardous Waste/ Environmental Site Assessment. The southwest corner of the intersection is a contaminated property until it is cleaned up. Infiltration Devices should not be placed in locations over previously identified contaminated groundwater plumes.

Detention Devices, Checklist T-1, Parts 1 and 5

- Detention Devices are not included into this project. It is not viable due to low Water Quality Volume (WQV) of the storm water flow towards device=3000 cubic ft.

  is less than the required minimum of 4356 cubic ft (0.1 acre-ft) to justify placement of the device.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

- GSRDs are not included in this project. There is no 303(d) listing for litter.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

- Traction Sand Traps are not included in this project. Traction Sand is not utilized in this area at least twice a year.

Media Filters, Checklist T-1, Parts 1 and 8

- Media Filters are not included into this project. It is not viable due to low Water Quality Volume (WQV) of the storm water flow towards device =3000 cubic ft. is less than the required minimum of 3,500 cubic ft to justify placement of this device.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

- MCTTs are not included in this project. There are no critical source areas, such as vehicle service facilities, parking areas, paved storage areas and fueling stations within the project limits.

Wet Basins, Checklist T-1, Parts 1 and 10

- Wet Basins are not included in this project. Permanent source of water is not obtainable in adequate amounts to sustain the permanent pool for the basin.

Total cost of Permanent Treatment BMP is $100,000

6. Proposed Temporary Construction Site BMPs to be used on Project

- Construction site BMPs shall be selected from the following categories:
    1. Soil Stabilization Practices
    2. Sediment Control Practices
    3. Tracking Control Practices
    4. Wind Erosion Control
    5. Non-Stormwater Controls
    6. Waste Management and Material Pollution Controls

- The following are the selected items being considered for developing the quantity and cost for Construction site BMPs:

item code	description	cost
074028	Temporary Fiber Roll	$18,000
074029	Temporary Silt Fence	$18,000
074031	Temporary Gravel Bag Berm	$18,000
074040	Temporary Hydraulic Mulch	$8,600
074041	Street Sweeping	$18,000
074019	Prepare Storm Water Pollution -Prevention Plan	$10,000
074056	Rain Event Action Plan	$17,000
074016	Construction Site Management	$10,000
074057	Storm Water Annual Report	$2,000
074058	Storm Water Sampling and -Analysis Day	$18,000
066595	Water Pollution Control -Maintenance Sharing	$10,000
066596	Additional Water Pollution -Control	$6,000
066597	Stormwater Sampling and -Analysis	$6,000

- Dewatering will be required during the construction of the new bridge structure and drainage structure extension.
- On September 3, 2010, Aythem Al-Saleh, Dist. Const. Stormwater Coordinator, agreed to the temp. const. Site BMP Strategy used for the scope of this project.
- The estimated cost for Construction Site BMPs is $159,6000.

7. Maintenance BMPs (Drain Inlet Stenciling)

- Drain Inlet Stenciling is not needed within the project boundaries.

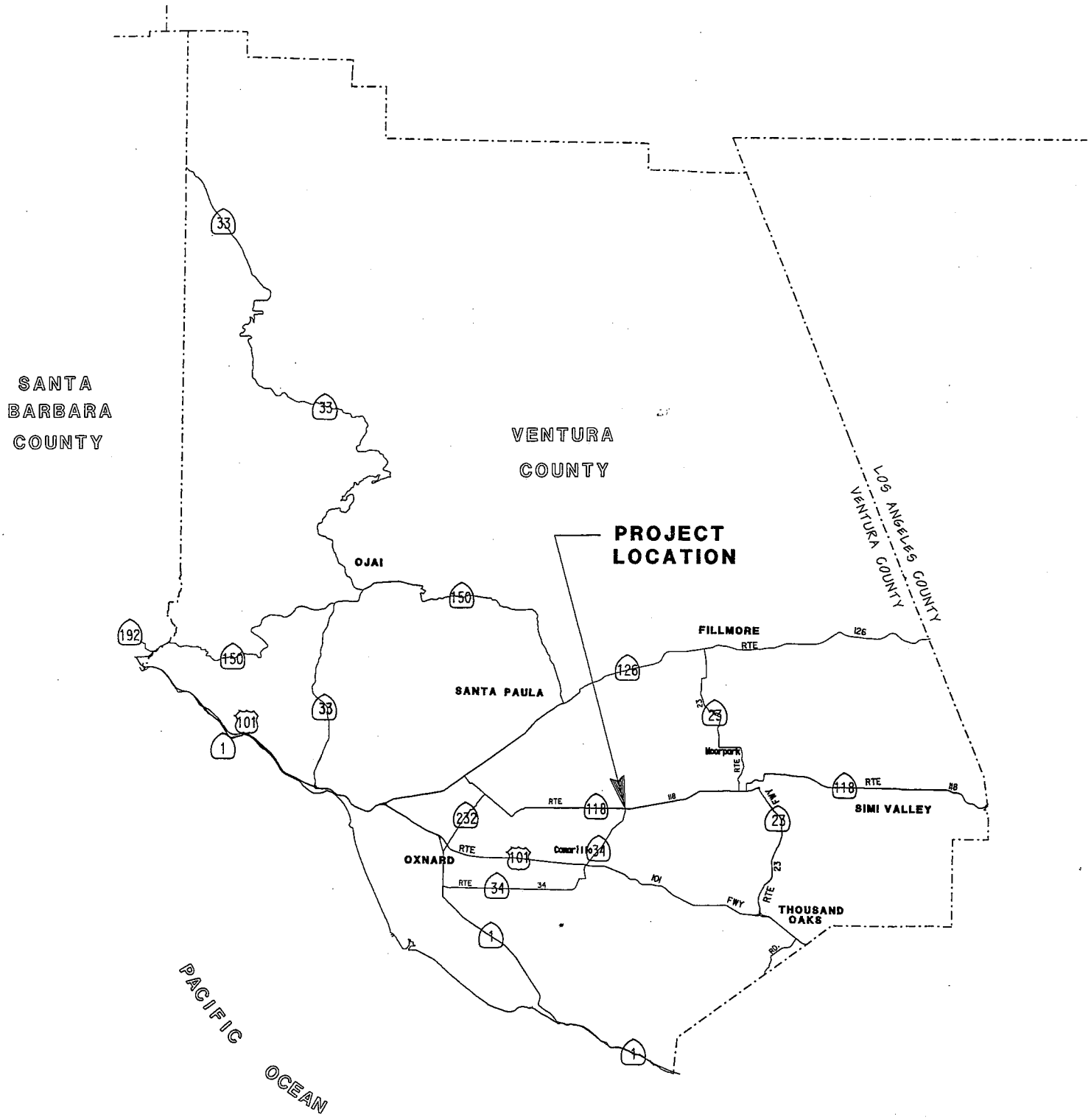
Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

Supplemental Attachments

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- BMP cost information from: Project Planning Cost Estimate (PPCE)
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- Checklists T-1, Parts 1–10 (Treatment BMPs) [only those Parts that are applicable]



VICINITY MAP
NO SCALE

CALTRANS
DISTRICT 07
HIGHWAY SYSTEM

EA 105960
07-Ven-118
PM 10.72/11.8

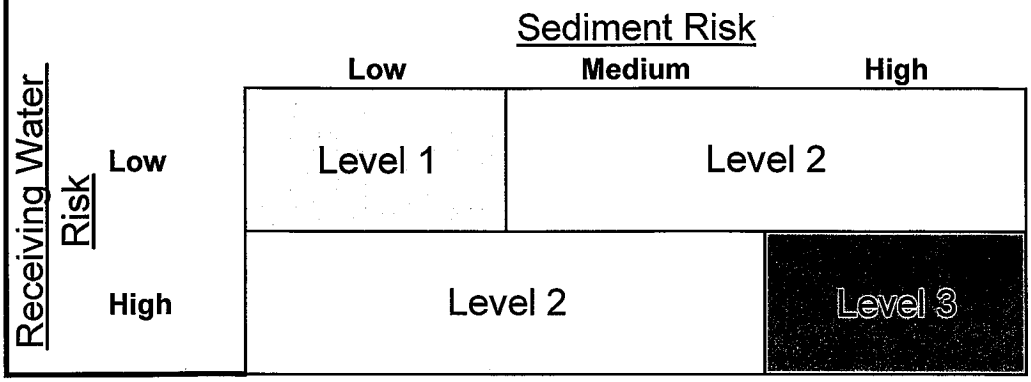
DATE: 02-07-11

Project ID (or EA): 105960

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. 4/12/11 S.P. *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(VENTURA COUNTY)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?			If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. 2.8 Acres (Alternative 2) *(Net Increase New Impervious Surface)*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

1 ***See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs***

Combined Risk Level Matrix



Project Sediment Risk: **High**

Project RW Risk: **High**

Project Combined Risk: **Level 3**

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5		**R Factor Value**	95.38
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9		**K Factor Value**	0.25
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		

	A	B	C
12	LS Table		
13	**LS Factor Value**		3.49
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		83.21905
16	**Site Sediment Risk Factor**		**High**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please check the attached worksheet or visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml	**Yes**	**High**
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

Checklist SW-1, Site Data Sources

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM :10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: Los Angeles, Region 4

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• Location Map:T:\\gis\dgn\quadmaps\nocontours\000index.dgn	2008
• Caltrans Topo Maps:T\topo\709007e0501.2df.dgn thru 70907e0507.dgn	2009
• Aerial Photos:I:\10596k\09007_ortho\09007_shts1-7_ortho.tif	2009
Hydraulic	
• District 07 Hydraulics Report	2010
• District 07 Watershed Index Map, http:/www.dot.ca.gov/dist07/divisions/design/watershed/docs/200ktile10.pdf	2008
Soils	
• Preliminary Geotechnical Study-Prepared by ESC-Division of Geotechnical Services Office of Geotechnical Design South-1	2009
Climatic	
• Caltrans Storm Water Quality Handbooks, Construction Site Best Management Practices Manual, March 1, 2003, Section 2, Page 3 of 11	2003
• Sunset Western Garden, http://www.sunset.com/garden/climate - zones	2010
Water Quality	
• Hazardous Material/Waste Information-Environmental Site Assessment Report (ESA)	2009
• RWQCB Jurisdiction and Basin Plan, http:ww.waterboards.ca.gov	1998
• Identifying TMDLs within project limits, http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/tmdl_list.shtml	2008
• Water Quality Planning Tools, http://www.stormwater.waterprograms.com/wqpt.htm	2006
Other Data Categories	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by:Darrel Cruz Date:02-07-11 District-Co-Route:07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA):105960 RWQCB:Los Angeles, Region 4

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6. Determine if a 401 certification will be required.	☒Complete	☐NA
7. List rainy season dates.	☒Complete	☐NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10. Determine contaminated soils within the project area.	☒Complete	☐NA
11. Determine the total disturbed soil area of the project.	☒Complete	☐NA
12. Describe the topography of the project site.	☒Complete	☐NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☐Complete	☒NA
15. Determine if a right-of-way certification is required.	☒Complete	☐NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☐Complete	☒NA
17. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19. Evaluate the presence of dry weather flow.	☒Complete	☐NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by:Darrel Cruz Date:02-07-11 District-Co-Route:07-Ven-118

PM :PM10.72/11.8 KP(17.25/18.99) Project ID (or EA):105960 RWQCB:L.A, Region 4

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☒No	☐NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☐Yes	☐No	☒NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☐Yes	☐No	☒NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☐Yes	☐No	☒NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☐Yes	☐No	☒NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☐Yes	☒No	☐NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☐Yes	☒No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☐Yes	☒No	☐NA

Design Pollution Prevention BMPs

Checklist DPP-1, Part 1

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM :10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: Los Angeles, Region 4

Consideration of Design Pollution Prevention BMPs

Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]

Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☐Yes	☒No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

Slope/Surface Protection Systems

Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
Will project create new slopes or modify existing slopes?	☐Yes	☐No	☒NA
Will it be necessary to direct or intercept surface runoff?	☐Yes	☐No	☒NA
Will cross drains be modified?	☐Yes	☐No	☒NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

Preservation of Existing Vegetation

It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs

Checklist DPP-1, Part 2

Prepared by:Darrel Cruz Date:02-07-11 District-Co-Route: :07-Ven-118

PM : PM10.72/11.8 KP(17.25/18.99 Project ID (or EA): 105960 RWQCB: L.A., Region 4

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent practicable.	☒Complete
2. Review channel lining materials and design for stream bank erosion control.	☒Complete
(a) See Chapters 860 and 870 of the HDM.	☒Complete
(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	☒Complete
3. Include, where appropriate, energy dissipation devices at culvert outlets.	☒Complete
4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☒Complete
5. Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges.	☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: Los Angeles, Region 4

Slope / Surface Protection Systems

1. What are the proposed areas of cut and fill? (attach plan or map)	☒Complete
2. Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows?	☐Yes ☒No
3. Were slopes rounded and/or shaped to reduce concentrated flow?	☒Yes ☐No
4. Were concentrated flows collected in stabilized drains or channels?	☒Yes ☐No
5. Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)?	☒Yes ☐No
If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.	
6. Are new or disturbed slopes > 2:1 (h:v)?	☐Yes ☒No
If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 2:1 (h:v).	
7. Estimate the net new impervious area that will result from this project. 2.8 acres	☒Complete

VEGETATED SURFACES

1. Identify existing vegetation.	☒Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies.	☒Complete
3. How long will it take for permanent vegetation to establish?	☒Complete
4. Minimize overland and concentrated flow depths and velocities.	☒Complete

HARD SURFACES

1. Are hard surfaces required?	☒Yes ☐No
If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations.	☒Complete
Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.	☒Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 4

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM :10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: L.A., Region 4

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, and 835, and Chapter 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 4:1 h:v. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 5

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: L.A., Region 4

Preservation of Existing Vegetation

1. Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation. ☒Complete
2. Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans? ☐Yes ☒No
3. Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling? ☒Complete
4. Have impacts to preserved vegetation been considered while work is occurring in disturbed areas? ☒Yes ☐No
5. Are all areas to be preserved delineated on the plans? ☐Yes ☒No

Treatment BMPs
Checklist T-1, Part 1

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: L.A., Region 4

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed. Questions 14 through 16 should be answered after all subwatershed (drainages) are considered using this checklist.

1. Is the project in a watershed with prescriptive TMDL treatment BMP requirements in an adopted TMDL implementation plan? ☐Yes ☒No

   If Yes, consult the District/Regional Storm Water Coordinator to determine whether the T-1 checklist should be used to propose alternative BMPs because the prescribed BMPs may not be feasible or other BMPs may be more cost-effective. Special documentation and regulatory response may be necessary.

2. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☐Yes ☒No

   If Yes to both 2 (a) and (b), continue to (c). If No to either, skip to question 3.

   (c) Is connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☐Yes ☒No

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☒No

   If Yes was answered to all of these questions consider ***Dry Weather Flow Diversion***, complete and attach **Part 3** of this checklist

3. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☐Yes ☒No

If Yes, consider ***Gross Solids Removal Devices (GSRDs)***, complete and attach **Part 6** of this checklist. Note: Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter. Before considering GSRDs for stand-alone installation or in sequence with other BMPs, consult with District/Regional NPDES Storm Water Coordinator to determine whether Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins should be considered instead of GSRDs to meet litter/trash TMDL.

4. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year? ☐Yes ☒No

   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist.

5. Maximizing Biofiltration Strips and Swales

   Objectives:

   1) Quantify infiltration from biofiltration alone

   2) Identify highly infiltrating biofiltration (i.e. > 90%) and skip further BMP consideration.

   3) Identify whether amendments can substantially improve infiltration.

   (a) Have biofiltration strips and swales been designed for runoff from all project areas, including sheet flow and concentrated flow conveyance? If no, document justification in Section 5 of the SWDR. ☐Yes ☒No

   (b) Based on site conditions, estimate what percentage of the WQV[1] can be infiltrated. When calculating the WQV, use a 12-hour drawdown for Type A and B soils, a 24-hour drawdown for Type C soils, and a 48-hour drawdown for Type D soils. ☒Complete

   __X__ < 20%
   ___ 20 % - 50%
   ___ 50% - 90%
   ___ > 90%

   (c) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☒No

[1] A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm

(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils[2]). ☐Yes ☒No

If Yes, consider including soil amendments; increasing the infiltration ranking allows more flexibility in the selection of BMPs (strips and swales will show performance comparable to other BMPs). Record the new infiltration estimate below:

___ < 20% (skip to 6)
___ 20 % - 50% (skip to 6)
___ 50% - 90% (skip to 6)
___ >90%

☐Complete

(e) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☐No

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPES Municipal Stormwater Permit[3]). If Yes proceed to question 13. ☐Yes ☒No

7. Estimating Infiltration for BMP Combinations

Objectives:

1) Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.

2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices

(a) Has concentrated infiltration (i.e., via earthen basins or earthen filters) been prohibited? Consult your District/Regional Storm Water Coordinator and/or environmental documents. ☐Yes ☒No

If No proceed to 7 (b); if Yes skip to question 8 and do not consider earthen basin-type BMPs

---

[2] Type D soils are not expected where amendments are incorporated

[3] See pages 39 and 40 of the Fact Sheets for the CGP.
http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

(b) Assess infiltration of an infiltration BMP that is used in conjunction with biofiltration. Include infiltration losses from biofiltration, if biofiltration is feasible. ☐Complete

(use 24 hr WQV)

___ < 20% (do not consider this BMP combination)

___ 20% - 50%

___ 50% - 90%

___ >90%

Is at least 90 percent infiltration estimated? If Yes proceed to 13. If No proceed to 7(c). ☐Yes ☐No

(c) Assess infiltration of biofiltration with combinations with remaining approved earthen BMPs using water quality volumes based on the drain time of those BMPs. This assessment will be used in subsequent BMP selection matrices.

Earthen Detention Basin (use 48 hr WQV)	Earthen Austin SF (use 48 hr WQV)
___ < 20%	___ < 20%
___ 20% - 50%	___ 20% - 50%
___ > 50%	___ > 50%

☐Complete

Continue to Question 8

8. Identifying BMPs based on the Target Design Constituents

(a) Does the project discharge to a water body that has been placed on the 303-d list or has had a TMDL adopted? If "No," use Matrix A to select BMPs, consider designing to treat 100% of the WQV, then skip to question 12. ☒Yes ☐No

If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply below)?

☒ sediments	☒ copper (dissolved or total)
☐ phosphorus	☐ lead (dissolved or total)
☒ nitrogen	☒ zinc (dissolved or total)
	☐ general metals (dissolved or total)[1]

(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9. ☒Yes ☐No

[1] General metals include cadmium, nickel, chromium, and other trace metals. Note that selenium and arsenic are not metals. Mercury is a metal, but is considered later during BMP selection, under Question 12 below.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Strip: HRT > 5 Austin filter (concrete) Austin filter (earthen) Delaware filter MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Swale MCTT Wet basin	Austin filter (concrete) Delaware filter MCTT Wet basin
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

9. Treating both Metals and Nutrients.

   Is copper, lead, zinc, or general metals *AND* nitrogen or phosphorous a TDC? If Yes use Matrix D to select BMPs, then skip to question 12. Otherwise, proceed to question 10. ☐Yes ☐No

10. Treating Only Metals.

    Are copper, lead, zinc, or general metals listed TDCs? If Yes use Matrix B below to select BMPs, and skip to question 12. Otherwise, proceed to question 11. ☐Yes ☐No

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	MCTT Wet basin Austin filter (earthen) Austin filter (concrete) Delaware filter	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Biofiltration Strip Biofiltration Swale Wet basin
Tier 2	Strip: HRT > 5 Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

11. Treating Only Nutrients.
    Are nitrogen and/or phosphorus listed TDCs? If "Yes," use Matrix C to select BMPs. If "No", please check your answer to 8(a). At this point one of the matrices should have been used for BMP selection for the TDC in question, unless no BMPs are feasible. ☐Yes ☐No

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Austin filter (earthen) Austin filter (concrete) Delaware filter**	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Wet basin Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale Wet basin	Austin filter (concrete) Delaware filter Wet basin
* Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			
** Delaware filters would be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.			

BMP Selection Matrix D: Any metal, plus phosphorous and / or nitrogen are the TDCs			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Wet basin* Austin filter (earthen) Austin filter (concrete) Delaware filter**	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches***	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches*** Biofiltration Strip Biofiltration Swale
Tier 2	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
* The wet basin should only be considered for phosphorus			
** In cases where earthen BMPs can infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.			
*** Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

12. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for mercury or low dissolved oxygen? ☐Yes ☒No

    If Yes contact the District/Regional NPDES Storm Water Coordinator to determine if standing water in a Delaware filter, wet basin, or MCTT would be a risk to downstream water quality.

13. After completing the above, identify and attach the checklists shown below for every Treatment BMP under consideration. (use one checklist every time the BMP is considered for a different drainage within the project) ☒Complete

    _X_ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
    ____ Dry Weather Diversion: Checklist T-1, Part 3
    _X_ Infiltration Devices: Checklist T-1, Part 4
    _X_ Detention Devices: Checklist T-1, Part 5
    ____ GSRDs: Checklist T-1, Part 6
    ____ Traction Sand Traps: Checklist T-1, Part 7
    _X_ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    _X_ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    _X_ Wet Basins: Checklist T-1, Part 10

14. Estimate what percentage of WQV (or WQF, depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): _20%_ ☒Complete

    (a) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

15. Estimate what percentage of the net WQV (for all new impervious surfaces within the project) that will be treated by the preferred treatment BMP(s): _20%_ ☒Complete

16. Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval. ☒Complete

Treatment BMPs
Checklist T-1, Part 2

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA): 105960 RWQCB: L.A., Region 4

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? ☒Yes ☐No

   If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐Yes ☒No
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres ☐Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☐No

2.	Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.)	☐Yes	☐No
3.	Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)*	☐Yes	☐No
4.	Is the maximum length of a biofiltration strip ≤ 300 ft? *	☐Yes	☐No
5.	Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of Maintenance? *	☐Yes	☐No
6.	Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? **	☐Yes	☐No
7.	Is the biofiltration strip sized as long as possible in the direction of flow? **	☐Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☐Yes	☐No

Treatment BMPs
Checklist T-1, Part 4

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99) Project ID (or EA):105960 RWQCB: L.A., Region 4

Infiltration Devices

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐Yes	☒No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐Yes	☒No
5.	Is site located over a previously identified contaminated groundwater plume?	☒Yes	☐No
	If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
6.	(a) Does site have groundwater within 10 ft of basin invert?	☐Yes	☐No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr?	☐Yes	☐No
	If "Yes" to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.		
7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If "Yes", continue to Design Elements sections. If "No", continue to Question 8.	☐Yes	☐No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 9.	☐Yes	☐No
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Infiltration Basin

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Has an overflow spillway with scour protection been provided? *	☐Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) *	☐Yes	☐No
4.	Can access be placed to the invert of the Infiltration Basin? *	☐Yes	☐No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.3.1)? *	☐Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☐Yes	☐No
7.	Can vegetation be established in the Infiltration Basin? **	☐Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☐Yes	☐No
9.	Can a gravity-fed Maintenance Drain be placed? **	☐Yes	☐No

Design Elements – Infiltration Trench

* **Required** Design Element – (see definition above)

** **Recommended** Design Element – (see definition above)

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A or B? *	☐Yes	☐No
3.	Is the volume of the Infiltration Trench equal to at least the 2.85x the WQV, while maintaining a drawdown time of ≤ 96 hours? It is recommended to use a drawdown time between 40 and 48 hours. (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet], unless the District/Regional NPDES Storm Water Coordinator will allow a volume between 2,830 ft^3 and 4,356 ft^3 to be considered.) *	☐Yes	☐No
4.	Is the depth of the Infiltration Trench ≤ 13 ft? *	☐Yes	☐No
5.	Can an observation well be placed in the trench? *	☐Yes	☐No
6.	Can access be provided to the Infiltration Trench? *	☐Yes	☐No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using vegetation)? *	☐Yes	☐No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **	☐Yes	☐No
9.	Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 5

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99 Project ID (or EA): 105960 RWQCB: L.A., Region 4

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? ☒Yes ☐No

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet]) ☐Yes ☒No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV plus the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☐Yes ☐No

3. Is basin invert ≥10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

If No to any question above, then Detention Devices are not feasible.

4. Does adequate area exist within the right-of-way to place Detention Device(s)? ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Detention Device(s) and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has the geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined Detention Device is a concern, consider using an impermeable liner. *	☐Yes	☐No
2.	Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☐Yes	☐No
3.	Can a minimum freeboard of 12 inches be provided above the overflow event elevation? *	☐Yes	☐No
4.	Is an overflow outlet provided? *	☐Yes	☐No
5.	Is the drawdown time of the Detention Device within 24 to 72 hours with 40-hrs the preferred design drawdown time? *	☐Yes	☐No
6.	Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *	☐Yes	☐No
7.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *	☐Yes	☐No
8.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.*	☐Yes	☐No
9.	Has sufficient access for Maintenance been provided? *	☐Yes	☐No
10.	Is the side slope 4:1 (h:v) or flatter for interior slopes? ** (Note: Side slopes up to 3:1 (h:v) allowed with approval by District Maintenance.)	☐Yes	☐No
11.	If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **	☐Yes	☐No
12.	Is flow path as long as possible ($\geq$ 2:1 length to width ratio at WQV elevation is recommended)? **	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 8

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99 Project ID (or EA): 105960 RWQCB: L.A., Region 4

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet]) ☐Yes ☒No
2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No
3. If initial chamber has an earthen bottom, is initial chamber invert ≥3 ft above seasonally high groundwater? ☒Yes ☐No
4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☐Yes ☐No

   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Feasibility- Delaware Filter

1. Is the volume of the Delaware Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet], consult with District/Regional Design Storm Water Coordinator if a lesser volume is under consideration.) ☐Yes ☒No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No

3. Would a permanent pool of water be allowed by the local vector control agency? Confirm that check valves and vector proof lid as shown on standard detail sheets will be allowed, is used. ☒Yes ☐No

If No to any question, then a Delaware Filter is not feasible

4. Does adequate area exist within the right-of-way to place a Delaware Filter(s)? If Yes, continue to Design Elements sections. If No, continue to Question 5. ☐Yes ☐No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6. ☐Yes ☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

7. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for bacteria, mercury, sulfides, or low dissolved oxygen? ☐Yes ☐No

   If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

   If a Delaware Filter is still under consideration, continue to the Design Elements – Delaware Filter section.

Design Elements – Austin Sand Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Is the drawdown time of the 2nd chamber 24 hours? *	☐Yes ☐No
2.	Is access for Maintenance vehicles provided to the Austin Sand Filter? *	☐Yes ☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☐Yes ☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥2:1? **	☐Yes ☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes ☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9.	☐Yes ☐No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥10 ft)? * If No, design with an impermeable liner.	☐Yes ☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? *	☐Yes ☐No
9.	Is maximum depth ≤13 ft below ground surface? *	☐Yes ☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes ☐No

Design Elements – Delaware Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Is the drawdown time of the 2nd chamber between 40 and 48 hours, typically 40-hrs? *	☐Yes ☐No
2.	Is access for Maintenance vehicles provided to the Delaware Filter? *	☐Yes ☐No
3.	Is a bypass/overflow provided for storms > WQV? **	☐Yes ☐No
4.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes ☐No
5.	Is maximum depth ≤13 ft below ground surface? *	☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 9

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99 Project ID (or EA): 105960 RWQCB: L.A., Region 4

MCTT (Multi-chambered Treatment Train)

Feasibility

1. Is the proposed location for the MCTT located to serve a "critical source area" (i.e. vehicle service facility, parking area, paved storage area, or fueling station)? ☐Yes ☒No

2. Is the WQV ≥ 4,346 ft³ [0.1 acre-foot]? ☐Yes ☒No

3. Is there sufficient hydraulic head (typically ≥6 feet) to operate the device? ☒Yes ☐No

4. Would a permanent pool of water be allowed by the local vector control agency? Confirm that check valves and vector proof lid as shown on standard detail sheets be allowed. ☒Yes ☐No

   If No to any question above, then an MCTT is not feasible.

5. Does adequate area exist within the right-of-way to place an MCTT(s)? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

8. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for bacteria, mercury, sulfides, low dissolved oxygen, or odors? ☐Yes ☐No

   If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Is the maximum depth of the 3rd chamber ≤13 ft below ground surface and has Maintenance accepted this depth? *	☐Yes	☐No
2.	Is the drawdown time in the 3rd chamber between 24 and 48 hours, typically designed for 24-hrs? *	☐Yes	☐No
3.	Is access for Maintenance vehicles provided to all chambers of the MCTT? *	☐Yes	☐No
4.	Is there sufficient hydraulic head to operate the device? *	☐Yes	☐No
5.	Has a bypass/overflow been provided for storms > WQV? *	☐Yes	☐No
6.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes	☐No

Treatment BMPs
Checklist T-1, Part 10

Prepared by: Darrel Cruz Date: 02-07-11 District-Co-Route: 07-Ven-118

PM : 10.72/11.8 KP(17.25/18.99 Project ID (or EA): 105960 RWQCB: L.A., Region 4

Wet Basin

Feasibility

1.	Is the volume of the Wet Basin above the permanent pool equal to at least the WQV using a 24 to 96 hour drawdown (40 to 48 hour drawdown preferred)? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet] and the permanent pool must be at least 3x the WQV.)	☐Yes	☒No
2.	Is a permanent source of water available in sufficient quantities to maintain the permanent pool for the Wet Basin?	☐Yes	☒No
3.	Is proposed site in a location where naturally occurring wetlands do not exist?	☐Yes	☐No
	Answer either question 4 or question 5:		
4.	For Wet Basins with a proposed invert above the seasonally high groundwater, Are NRCS Hydrologic Soil Groups [HSG] C and D at the proposed invert elevation, or can an impermeable liner be used? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.)	☐Yes	☒No
5.	For Wet Basins with a proposed invert below the groundwater table: Can written approval from the local Regional Water Quality Control Board be obtained to place the Wet Basin in direct hydraulic connectivity to the groundwater?	☐Yes	☐No
6.	Is freeboard provided ≥1 foot?	☒Yes	☐No
7.	Is the maximum impoundment volume < 14.75 acre-feet?	☒Yes	☐No
8.	Would a permanent pool of water be allowed by the local vector control agency?	☒Yes	☐No
	If No to any question above, then a Wet Basin is not feasible.		
9.	Is the maximum basin width ≤49 ft as suggested in Section B.10.2?	☐Yes	☐No
	If No, consult with the local vector control agency and District Maintenance.		

10. Does adequate area exist within the right-of-way to place a Wet Basin? ☐Yes ☐No
    If Yes, continue to Design Elements sections.

    If No, continue to Question 11.

11. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
    If Yes, continue to Design Elements section.

    If No, continue to Question 12.

12. Have the appropriate state and federal regulatory agencies been contacted to discuss location and potential to attract and harbor sensitive or endangered species? ☐Yes ☐No

    If No, contact the Regional/District NPDES Coordinator

13. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

14. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for bacteria, mercury, sulfides, low dissolved oxygen, or odors? ☐Yes ☐No

    If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Can a controlled outlet and an overflow structure be designed for storm events larger than the Water Quality event? *	☐Yes	☐No
2. Is access for Maintenance vehicles provided? *	☐Yes	☐No
3. Is the drawdown time for the WQV between 24 and 96 hours? *	☐Yes	☐No
4. Has appropriate vegetation been selected for each hydrologic zone? *	☐Yes	☐No
5. Can all design elements required by the local vector control agency be incorporated? *	☐Yes	☐No
6. Has a minimum flow path length-to-width ration of at least 2:1 been provided? **	☐Yes	☐No
7. Has an upstream bypass been provided for storms > WQV? **	☐Yes	☐No
8. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation, or a forebay)? **	☐Yes	☐No
9. Can public access be restricted using a fence if proposed at locations accessible on foot by the public? **	☐Yes	☐No
10. Is the maximum depth < 10 ft?"	☐Yes	☐No

STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION

QUANTITY CALCULATIONS

DO-CEM-4801 (OLD HC-52 REV. 11-92) 541-3520-0 SHEET ____ OF ____

JOB STAMP

ITEM WQV Calculations Approx. FILE NO

LOCATION SEGREGATION ☐ YES ☐ NO

CALC. BY PRAKASH YADAV DATE

CHK. BY DARREL CRUZ DATE 12/29/2010

FA 105961

118/34 Interchange Improvement

Alternative II

AREA CALCULATIONS. (APPROXIMATE CALCU).

	W1	W2	W Feet	L in Feet	A Ft²
118 HWY EB/WB					
(1) St 634 – 646+00	Avg 26	Avg 26	52 Avg	1200	62400
(2) St 646+00 – 665+30	Avg 23	Avg 23	46 Avg	1930	88780
34 HWY / NB/SB					
(1) 913+00 – 925+60	Avg 23	Avg 23	Avg 46	1260	57960
DONLON ALIGNMENT NB/SB					
0+00 – 7+90	Avg 20	Avg 20	40	790	31600

240740 Ft²

Conservative ¾" of Runoff

∴ Total WQV = A × Depth

= 240740 × ¾ × 1/12

= 15046.25 Ft³

Area calculation for proposed BMP (Bio Swale) One on each side

	L	W	A Ft²	WQV (A × ¾ × 1/12)
118 HWY only				
(1) St 634+00 – 646+00	1200'	26'	31200 × 0.30 = 15600 Ft²	975 Ft³
(2) St 646+00 – 651+00	500'	32'	16000 Ft² × 0.50 = 8000	500 Ft³
				1475 Ft³

On both side 2 Bio Swales

∴ WQV = 1475 × 2 Ft³

Ratio = Water treated by BMP / Total WQV for project Alt 2 = 1475 × 2 / 15046.25 = 19.6 %

≃ 20 %

POSTED BY DATE POSTED TO

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	VEN	118/34	PM 10.72/11.8 16.8/17.66		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

DATE REVISED	REVISED BY

CALCULATED-DESIGNED BY

CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

Disturbed Soil Area Sheet ECD-1

AREA	SQ. FT	ACREAGE
①	98181	2.24
②	38083	0.87
③	54463	1.30
Total=	190727	4.41

Total Disturbed Soil Area Alternative 2

Sheet	SQ. FT	ACREAGE
ECD-1	190727	4.41
ECD-2	73964	1.70
ECD-3	35027	0.81
ECD-4	28988	0.66
Total=	328706	7.58

MATCH LINE (L-4)

MATCH LINE (L-2)

MATCH LINE (L-3)

ROUTE 118

ROUTE 34

DONLON RD

LA CUMBRE

SOMIS RD

E LOS ANGELES AVE

ALLIANCE SOMIS SUPPLY SITE

DRAINAGE EASEMENT

SLOPE EASEMENT

EXISTING R/W

PROPOSED R/W

EXISTING ETW

ETW

EP

VE 118 POC 646+08.68
VE 34 PI 925+68.71

PI 0+00.00

1+17.24

BC 646+00.52

EC 649+73.44

BC 652+49.69

N 09°31'44" E 888.12'

ALTERNATIVE 2 DISTURBED SOIL AREA

1"=50'

ECD-1

LAST REVISION	DATE PLOTTED => 28-DEC-2010
00-00-00	TIME PLOTTED => 16:07

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s123048
DGN FILE => c1t2e2_english_50_sht1.dgn

CU 07265

EA 105960

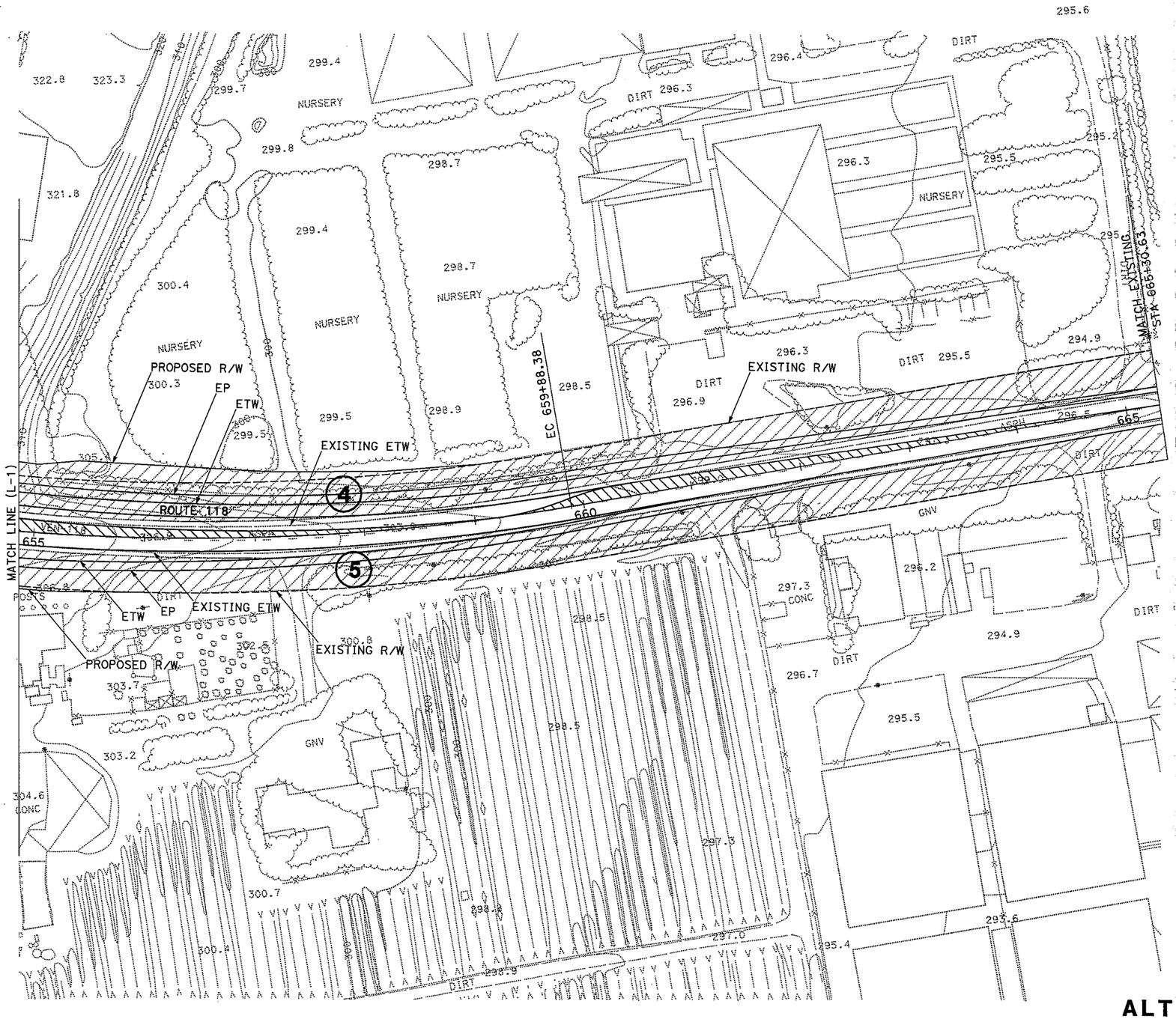
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	VEN	118/34	PM 10.72/11.8 16.8/17.66		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



Disturbed Soil Area Sheet ECD-2

AREA	SQ. FT	ACREAGE
④	39955	0.92
⑤	34009	0.78
Total=	73964	1.70

ALTERNATIVE 2
DISTURBED SOIL AREA

1"=50'

ECD-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => 29-DEC-2010 TIME PLOTTED => 11:09

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s123048 DGN FILE => c1t2e_english_50_sht2.dgn | CU 07265 | EA105960

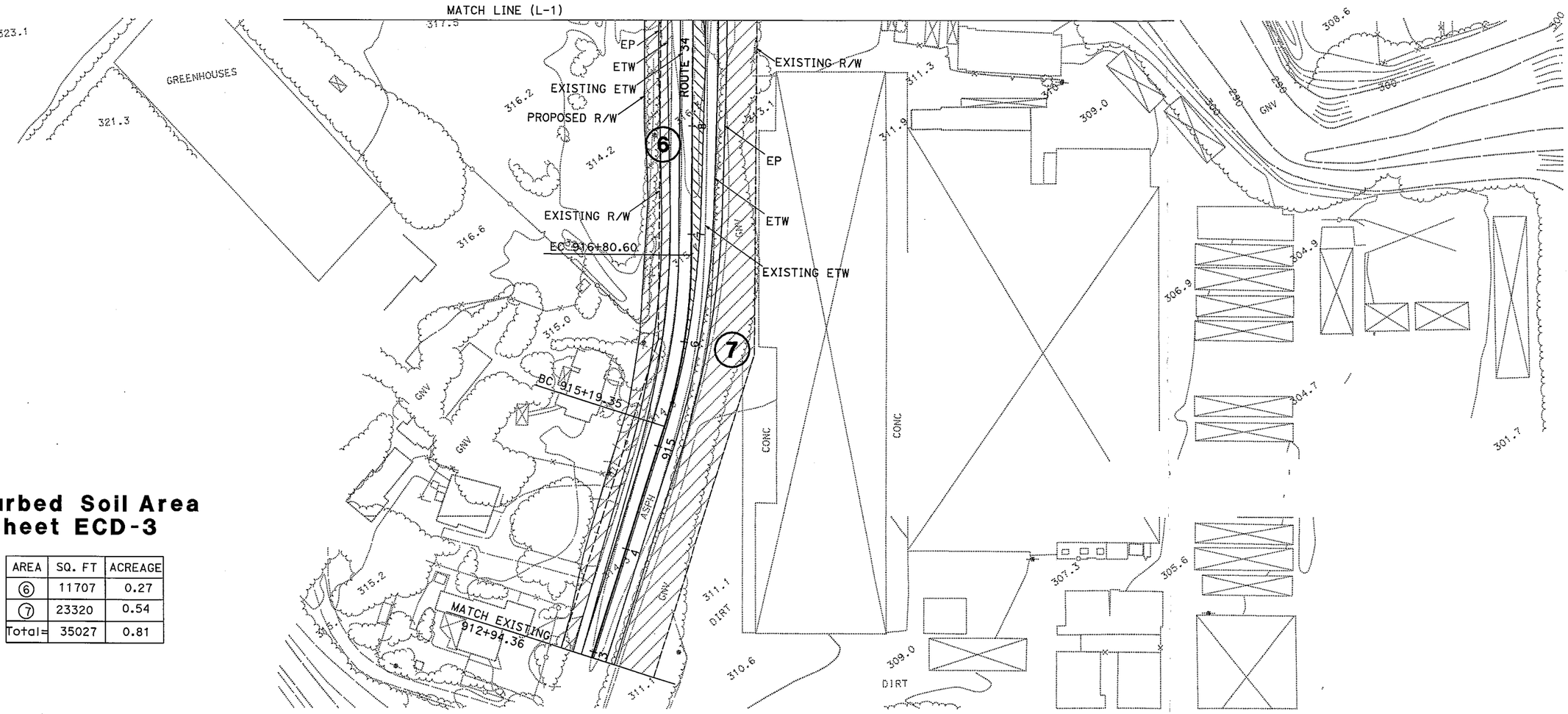
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	VEN	118/34	PM 10.72/11.8 16.8/17.66		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



Disturbed Soil Area
Sheet ECD-3

AREA	SQ. FT	ACREAGE
⑥	11707	0.27
⑦	23320	0.54
Total=	35027	0.81

ALTERNATIVE 2
DISTURBED SOIL AREA
1"=50'

ECD-3

LAST REVISION 00-00-00 | DATE PLOTTED => 28-DEC-2010 | TIME PLOTTED => 16:27

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s123048 | DGN FILE => alt2e_english_50_sht3.dgn | CU 07265 | EA 105960

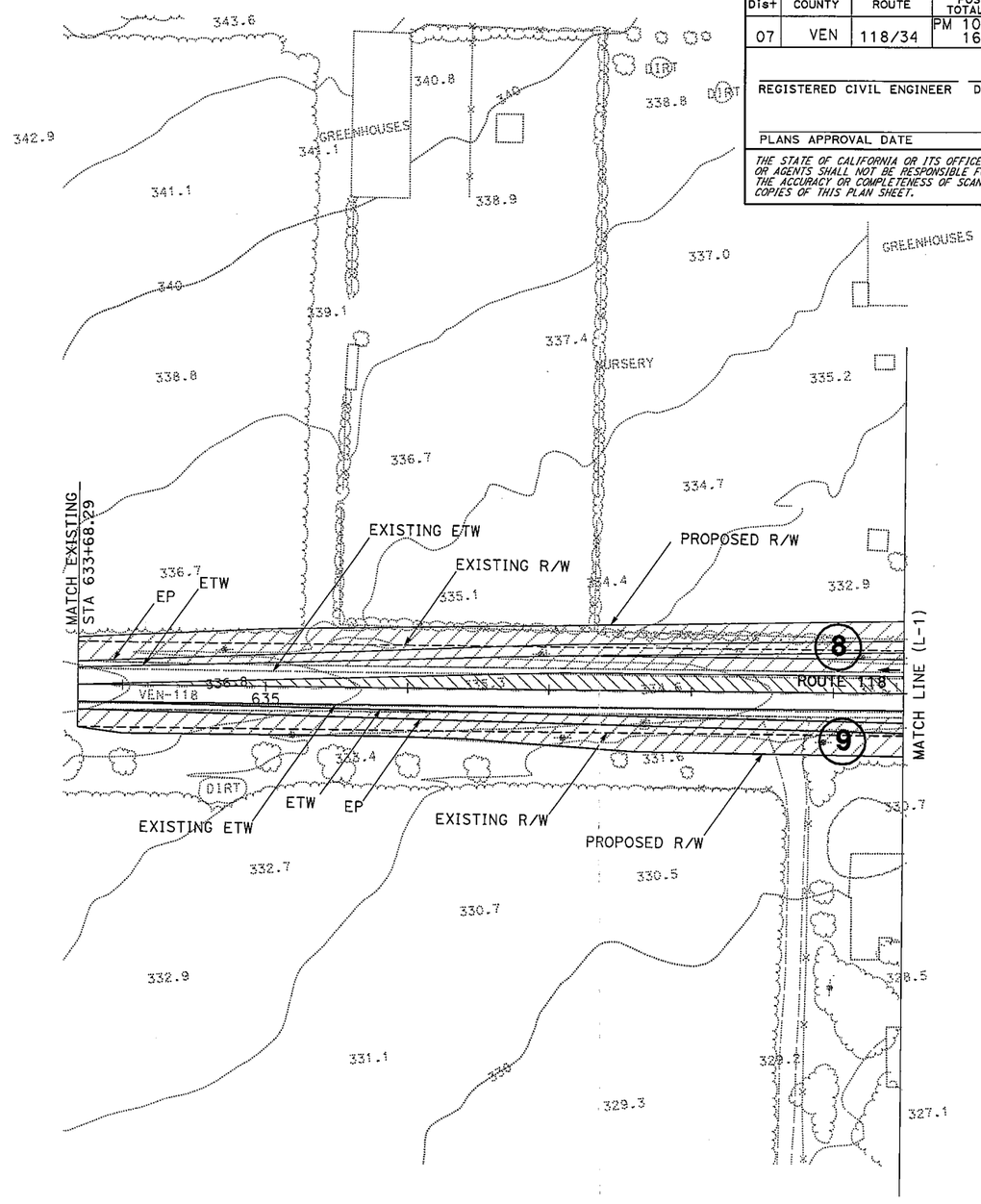
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	VEN	118/34	PM 10.72/11.8 16.8/17.66		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



Disturbed Soil Area
Sheet ECD-4

AREA	SQ. FT	ACREAGE
⑧	16521	0.38
⑨	12467	0.28

NURSERY

GREENHOUSES

ALTERNATIVE 2
DISTURBED SOIL AREA
1"=50'

ECD-4

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 00-00-00 | DATE PLOTTED => 28-DEC-2010 | TIME PLOTTED => 16:44

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s123048 | DGN FILE => alt2e2_english_50_sht4.dgn | CU 07265 | EA 105960